

## **ABSTRACT OF THE DISCLOSURE**

[27] A core composition of a metal-cored wire comprising a combination of graphite and potassium compounds has been proven to stabilize the arc in a straight polarity welding configuration. In particular, adding a combination of graphite and potassium manganese titanate ( $K_2 MnTiO_4$ ) and potassium sulfate ( $K_2 SO_4$ ) in the preferred combination of graphite and potassium compounds from the range of about 0.3% to about 5.0% wt resulted in a greatly stabilized arc, reduced spatter and reduced warpage while maintaining high deposition rates of the DCEN welding process